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| 10/520,917 | 01/11/2005 | Aymeric Perchant | 0501-1114 | 5145 |
| <small>465</small> YOUNG & THOMPSON 209 Madison Street Suite 500 ALEXANDRIA, VA 22314 | | | <small>7590</small> EXAMINER ALLISON, ANDRAE S | |
| | | | <small>05/30/2008</small> ART UNIT 2624 | PAPER NUMBER |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/520,917

Applicant(s)

PERCHANT ET AL.

Examiner

ANDRAE S. ALLISON

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 January 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 January 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-8508)
- Paper No(s)/Mail Date 4/11/2005
- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Specification

1. The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

Arrangement of the Specification

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT.
- (e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC.
- (f) BACKGROUND OF THE INVENTION.
 - (1) Field of the Invention.
 - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (g) BRIEF SUMMARY OF THE INVENTION.
- (h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (i) DETAILED DESCRIPTION OF THE INVENTION.
- (j) CLAIM OR CLAIMS (commencing on a separate sheet).
- (k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
- (l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

Content of Specification

- (a) Title of the Invention: See 37 CFR 1.72(a) and MPEP § 606. The title of the invention should be placed at the top of the first page of the specification unless the title is provided in an application data sheet. The title of the invention should be brief but technically accurate and descriptive, preferably from two to seven words may not contain more than 500 characters.
- (b) Cross-References to Related Applications: See 37 CFR 1.78 and MPEP § 201.11.
- (c) Statement Regarding Federally Sponsored Research and Development: See MPEP § 310.
- (d) The Names Of The Parties To A Joint Research Agreement: See 37 CFR 1.71(g).
- (e) Incorporation-By-Reference Of Material Submitted On a Compact Disc: The specification is required to include an incorporation-by-reference of electronic documents that are to become part of the permanent United States Patent and Trademark Office records in the file of a patent application. See 37 CFR 1.52(e) and MPEP § 608.05. Computer program listings (37 CFR 1.96(c)), "Sequence Listings" (37 CFR 1.821(c)), and tables having more than 50 pages of text were permitted as electronic documents on compact discs beginning on September 8, 2000.
- (f) Background of the Invention: See MPEP § 608.01(c). The specification should set forth the Background of the Invention in two parts:
 - (1) Field of the Invention: A statement of the field of art to which the invention pertains. This statement may include a paraphrasing of the applicable U.S. patent classification definitions of the subject matter of the claimed invention. This item may also be titled "Technical Field."
 - (2) Description of the Related Art including information disclosed under 37 CFR 1.97 and 37 CFR 1.98: A description of the related art known to the applicant and including, if applicable, references to specific related art and problems involved in the prior art which are solved by the applicant's invention. This item may also be titled "Background Art."

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- (g) Brief Summary of the Invention: See MPEP § 608.01(d). A brief summary or general statement of the invention as set forth in 37 CFR 1.73. The summary is separate and distinct from the abstract and is directed toward the invention rather than the disclosure as a whole. The summary may point out the advantages of the invention or how it solves problems previously existent in the prior art (and preferably indicated in the Background of the Invention). In chemical cases it should point out in general terms the utility of the invention. If possible, the nature and gist of the invention or the inventive concept should be set forth. Objects of the invention should be treated briefly and only to the extent that they contribute to an understanding of the invention.
- (h) Brief Description of the Several Views of the Drawing(s): See MPEP § 608.01(f). A reference to and brief description of the drawing(s) as set forth in 37 CFR 1.74.
- (i) Detailed Description of the Invention: See MPEP § 608.01(g). A description of the preferred embodiment(s) of the invention as required in 37 CFR 1.71. The description should be as short and specific as is necessary to describe the invention adequately and accurately. Where elements or groups of elements, compounds, and processes, which are conventional and generally widely known in the field of the invention described and their exact nature or type is not necessary for an understanding and use of the invention by a person skilled in the art, they should not be described in detail. However, where particularly complicated subject matter is involved or where the elements, compounds, or processes may not be commonly or widely known in the field, the specification should refer to another patent or readily available publication which adequately describes the subject matter.
- (j) Claim or Claims: See 37 CFR 1.75 and MPEP § 608.01(m). The claim or claims must commence on separate sheet or electronic page (37 CFR 1.52(b)(3)). Where a claim sets forth a plurality of elements or steps, each element or step of the claim should be separated by a line indentation. There may be plural indentations to further segregate subcombinations or related steps. See 37 CFR 1.75 and MPEP § 608.01(i)-(p).
- (k) Abstract of the Disclosure: See MPEP § 608.01(f). A brief narrative of the disclosure as a whole in a single paragraph of 150 words or less commencing on a separate sheet following the claims. In an international application which has entered the national stage (37 CFR 1.491(b)), the applicant need not submit an abstract commencing on a separate sheet if an abstract was published with the international application under PCT Article 21. The abstract that appears on the cover page of the pamphlet

published by the International Bureau (IB) of the World Intellectual Property Organization (WIPO) is the abstract that will be used by the USPTO. See MPEP § 1893.03(e).

- (l) Sequence Listing. See 37 CFR 1.821-1.825 and MPEP §§ 2421-2431. The requirement for a sequence listing applies to all sequences disclosed in a given application, whether the sequences are claimed or not. See MPEP § 2421.02.

Claim Objections

2. Claims 1-34 are objected to because of the following informalities:
- a. The phrase in "Method for processing...." in claim 1, should read "A method for processing".
 - b. The phrase "Method according.." in claim 2-31, should read "The method according" because the word "The" needs to be inserted at the beginning of each claim because each claim is refereeing to a previous claim.
 - c. The phrase "Apparatus for image...." in claim 32 should read "An apparatus for image...".
 - d. The phrase "Apparatus according..." in claim 33 should read "The apparatus according ..." because the word 'The' needs to be inserted at the beginning of the claim because it refers to a previous claim.
 - e. The phrase "Application of ..." in claim 34 should read "The application of ..." because the word "The" needs to be inserted at the beginning the claim because it refers to a previous claim.
- Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-31 and 33 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation "the pattern" in line 6. There is insufficient antecedent basis for this limitation in the claim.

Claim 3 recites the limitation "the related components " in line 3. There is insufficient antecedent basis for this limitation in the claim.

Claim 33 recites the limitation "it" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claims 2 and 4-31 are being rejected as incorporating the deficiencies of the claim upon which each respective claim depends.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States

only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1-3 and 32 are rejected under 35 U.S.C. 102(e) as being anticipated by Shankar et al (US Patent No.: 6,885,801).

As to independent claim 1, Shankar discloses a method for processing an image acquired by means of a guide consisting of a plurality of optical fibres (method for enhancing images acquired through a fiber endoscope – column 1, lines 23-29), characterized in that, for each optical fibre, a zone corresponding to this optical fibre is isolated on the acquired, each zone is locally processed individually image (see column 2, lines 47-57 – where each fiber is isolated and processed individually), then the acquired image is reconstructed eliminating the pattern due to the optical fibres (see column 5, lines 40-45, where interpolation is carried out to produce a final image).

As to independent claim 32, this claim differs from claim 1 only in that claim 32 is apparatus whereas, claim 1 is method and the limitations means for isolating, means for locally processing each zone individually, and means for reconstructing additively recited. Shankar clearly teaches a system comprising: means for isolating (208, 209 - see Fig 2), means for locally processing each zone individually (205 - see Fig 2), and means for reconstructing (230 - see Fig 2).

As to claim 2, Shankar teaches the method, characterized in that, in order to isolate each zone, a mask, corresponding to the pattern of the fibres, is applied to the acquired image (see column 2, lines 55-67).

As to claim 3, Shankar teaches the method, characterized in that the mask, corresponding to an image of the related components representing each fibre, is obtained during a stage of detecting the fibres from a reference image (note that a template is selected from a lookup table - see column 2, lines 55-67).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 4-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shankar et al (US Patent No.: 6,885,801) in view of Harris et al (NPL Document titled: Hybrid Image Segmentation Using Watersheds and Fast Region Merging).

As to claim 4, Shankar does not expressly disclose the method characterized in that the stage of detecting the fibres comprises the following stages: prefiltering of the reference image, segmentation by region, correction of segments having an abnormally large surface, and correction of segments having an abnormally small surface. Harris discloses an image segmentation algorithm (see abstract) which includes the steps of prefiltering of the reference image (see page 1687, section IV, [p][001], lines 1-9), segmentation by region (see page 1687, section IV, [p][001], lines 1-9), correction of segments having an abnormally large surface, and correction of segments having an

abnormally small surface (see page 1687, section IV, [p][001], lines 9-18). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to added to image segmentation algorithm of Haris to the method for enhancing images acquired through a fiber endoscope of Shankar to partition the endoscopic image into homogenous segments (spatially connected groups of pixels) such that that the union of any two neighboring segments yields a heterogeneous segment (see page 1684, section 1, [p][001])

As to claim 5, note the discussion above, neither Shankar or Haris teaches the method, characterized in that the two corrections stages are interchangeable and are carried out in an iterative way. However, it would have been obvious for one skilled in the art to interchangeable the two corrections stages or carried the correction stage iterative to meet design required and carry out either correction method does solve any particular problem.

9. Claims 7-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shankar et al (US Patent No.: 6,885,801) in view of Harris et al (NPL Document titled: Hybrid Image Segmentation Using Watersheds and Fast Region Merging) further in view of Miyazaki (US Patent No.: 4,926,257).

As to claim 7, note the discussion above, Haris teaches the method, characterized in that the prefiltering stage comprises a morphological opening stage (see page 1687, section IV, [p][002], lines 1-9) followed by an image-inversion stage. However, neither

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Shankar nor Haris teach an image-inversion stage. Miyazaki teaches an image-inversion stage (see column 1, lines 30-42). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have combined the teaching of Shankar as modified by Harris and Miyazaki to inverse the acquired images before output the images.

As to claim 8, note the discussion above, Miyazaki the method characterized in that the image-inversion stage is preceded by a scalar-type anisotropic scattering stage (see column 1, lines 40-45).

As to claim 9, Shankar teaches the method, characterized in that the prefiltering also comprises a stage during which an interpolation to the nearest neighbour is carried out in order to double the size of the image vertically and horizontally (see column 5, lines 40-45).

As to claim 10, note the discussion above, Haris teaches the method characterized in that, in the presence of a plurality of acquisition images, the prefiltering also comprises a temporal filtering stage (see abstract).

10. Claims 26-30 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shankar et al (US Patent No.: 6,885,801) in view of Nomami et al (US Patent No.: 5,764,809)

As to claim 17, Shankar teaches the method, characterized in that the reconstruction of the acquired image involves a calibration stage in order to calibrate the flux of the acquired image, after local processing. However, Shankar does not expressly disclose a mosaic reconstruction stage. Nomami discloses a method for forming new images (column 1, lines 12-15) including a mosaic reconstruction stage (see column 6, lines 26-39). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to added the method for forming new images of Nomami to the method for enhancing images acquired through a fiber endoscope of Shankar for processing multiple images acquired from the same object to eliminate abnormal data areas or provide a synthetic image having an enlarged field of view and improved resolution (see column 2, lines 7-12).

As to claim 34, note the discussion above, Nomami teaches the application of the image-processing method for super-resolution of an acquired image (see column 2, line 11).

As to claims 26-29, Shankar does not expressly disclose the method characterized in that the reference image is an image obtained by placing a mirror opposite the guide, characterized in that the reference image is an image obtained from a homogeneous scattering medium, characterized in that the reference image is an image obtained from a homogeneous fluorescent medium and characterized in that the

reference image is an image obtained from the backscattering inside the bundle of optical fibres constituting the guide. However, it would have been obvious for one skilled in the art to acquire the reference image by placing a mirror opposite the guide or from a homogeneous scattering medium or from a homogeneous fluorescent medium or from the backscattering inside the bundle of optical fibres constituting the guide because these are well known method for acquire images and backscattering for example has the characteristic of detecting optical faults (OFFICIAL NOTICE).

As to claim 30, Shankar teaches the method, characterized in that the reference image is the acquired image (note that the fiber mask is generated).

Allowable Subject Matter

11. Claims 11-16, 18-25 and 31 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Conclusion

12. The prior art made part of the record and not relied upon is considered pertinent to applicant's disclosure.

Taleblou (US Patent No.: 5878159) is cited to teach A method and apparatus for processing a digitized image obtained by a

multicore fiber.

Irion (US Patent No.: 6190308) is cited to teach an endoscopic video system

Karaki et al (US Patent No.: 4480636) is cited to teach an endoscope with image correction means

Ozawa et al (US Patent No.: 6080104) is cited to teach an electronic endoscope system

Haneishi et al (NPL Document titled: A New Method for Distortion Correction of Electronic Endoscope Images) is cited to teach a new method to correct barrel distortion.

Wei li et al (NPL Document titled: Enlargement and Enhancement of Electronic Endoscopic Images Based on Recursive Minimum-maximum Method) is cited to teach a method for compensating for the imperfections of endoscopic image.

Demjenova et al (NPL Document titled: Active contours in segmentation of fiber like objects) is cited to teach a method for active contour segmentation.

Inquires

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrae S. Allison whose telephone number is (571) 270-1052. The examiner can normally be reached on Monday-Friday, 8:00 am - 5:00 pm, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Meta can be reached on (571) 272-7453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Andrae Allison
May 21, 2008

/Andrew W. Johns/
Primary Examiner, Art Unit 2624